

We claim:

1. An insulated concrete panel, comprising:
  - (a) a first concrete layer;
  - (b) a second concrete layer spaced apart from the first concrete layer;
  - (c) an insulation layer;
  - 5 (d) a plurality of connectors interconnecting the two concrete layers through the insulation layer; and
  - (e) a post-tensioning tendon positioned substantially in the plane of the insulation layer.
- 10 2. A panel as defined in claim 1, wherein the post-tensioning tendon comprises:
  - (a) a longitudinal element extending over the majority of the panel length;
  - (b) anchorage members interconnecting the concrete layers with the longitudinal element for transferring a post-tensioning force from the longitudinal element to the concrete layers.
- 15 3. A panel as defined in claim 2, wherein the longitudinal element is comprised of a high-strength rod, strand, or bar.
4. A panel as defined in claim 2, wherein the longitudinal element is placed in a space  
20 formed in the insulation layer.
5. A panel as defined in claim 4, further comprising sheathing which covers a central portion of the longitudinal element.
- 25 6. A panel as defined in claim 2, wherein the longitudinal element is adjusted to produce tension in the longitudinal element and compression in the concrete layers.

7. A method for constructing an insulated concrete panel, comprising the steps of:
- (a) placing a first layer of plastic concrete;
  - (b) placing a layer of insulation on the first concrete layer;
  - (c) inserting a plurality of fasteners through the insulation layer into the first concrete layer such that the fasteners are embedded into the first concrete layer while the concrete is plastic;
  - (d) positioning a post-tensioning tendon in the insulation layer;
  - (e) placing a second concrete layer on the insulation layer and consolidated around exposed end portions of the plurality of fasteners; positioning in the concrete layers a pair of anchor plates a predetermined distance apart
  - (f) allowing the concrete layers to gain strength through curing; and
  - (g) adjusting the post-tensioning tendon to produce a force in the tendon and in the concrete layers.
8. A method as defined in claim 7, wherein the post-tensioning tendon comprises a high-strength longitudinal element and wherein the adjusting step comprises adjusting an end portion of the longitudinal element.
9. A method as defined in claim 8, wherein adjusting of the end portion of the longitudinal element produces tension in the longitudinal element and compression in the concrete layers.
10. A method as defined in claim 7, wherein positioning of the post-tensioning tendon occurs while the first concrete layer is still plastic.
11. A method as defined in claim 8, further comprising the step of forming a duct in the insulation layer for receiving the longitudinal element and wherein the longitudinal element is installed in the duct after the two concrete layers have gained strength.